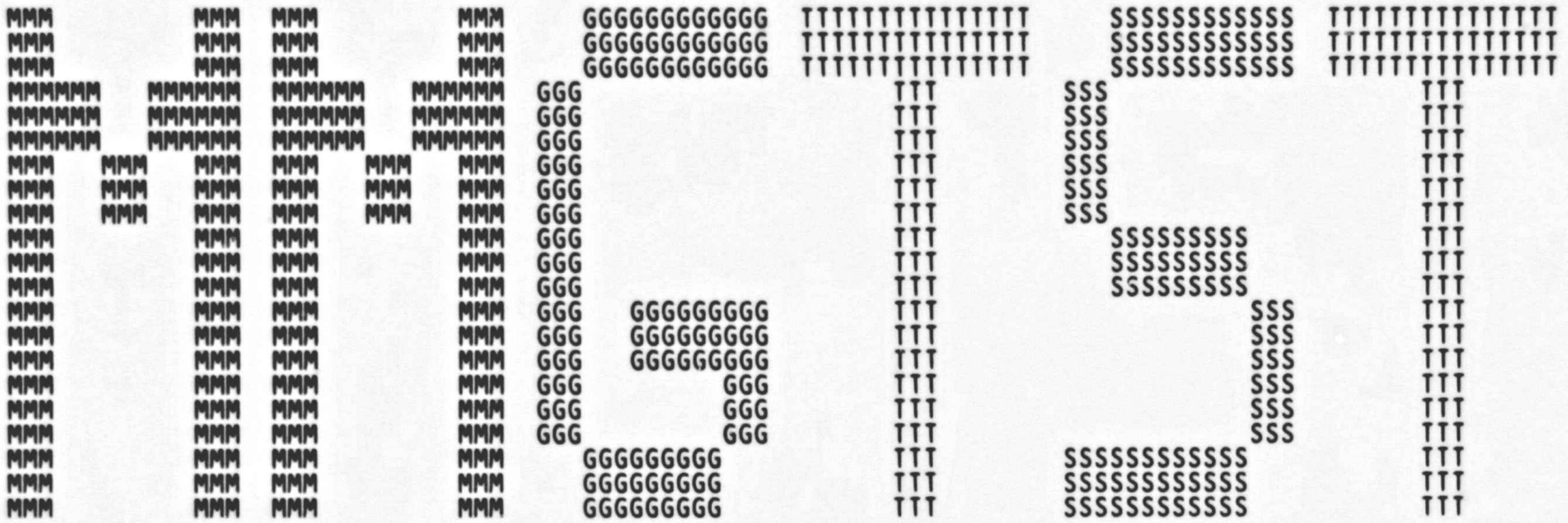
MMM MMM MMM MMM GGGGGGGGGGG TTTTTTTTTTTTTTT SSSSSSSSSSS TTTTTTTTTTTTTTT
MMMMMMM MMMMMMM MMMMMMM MMMMMMM GGG TTT SSS TTT
MMM MMM MMM MMM MMM MMM GGG TTT SSS TTT
MMM MMM MMM MMM MMM MMM GGG TTT SSS TTT
MMM MMM MMM MMM GGG TTT SSSSSSSSS TTT
MMM MMM MMM MMM GGG TTT SSS TTT
MMM MMM MMM MMM GGG GGGGGGGGG TTT SSS TTT
MMM MMM MMM MMM GGG GGGGGGGGG TTT SSS TTT
MMM MMM MMM MMM GGG GGG TTT SSS TTT
MMM MMM MMM MMM GGG GGG TTT SSS TTT
MMM MMM MMM MMM GGG GGG TTT SSSSSSSSSSS TTT
MMM MMM MMM MMM GGGGGGGGG TTT SSSSSSSSSSS TTT
MMM MMM MMM MMM GGGGGGGGG TTT SSSSSSSSSSS TTT

FILEID**MMGEXPCNT

```
MM      MM  MM      MM    GGGGGGGG  EEEEEEEEEE  XX      XX  PPPPPPPP      CCCCCCCC  NN      NN  TTTTTTTTTT
MM      MM  MM      MM    GGGGGGGG  EEEEEEEEEE  XX      XX  PPPPPPPP      CCCCCCCC  NN      NN  TTTTTTTTTT
MMMM  MMMM  MMMM  MMMM  GG          EE          XX      XX  PP      PP  CC          NN      NN      TT
MMMM  MMMM  MMMM  MMMM  GG          EE          XX      XX  PP      PP  CC          NN      NN      TT
MM  MM  MM  MM  MM  MM  GG          EE            XX  XX    PP      PP  CC          NNNN    NN      TT
MM  MM  MM  MM  MM  MM  GG          EE            XX  XX    PP      PP  CC          NNNN    NN      TT
MM      MM  MM      MM  GG          EEEEEEEE        XX      PPPPPPPP    CC          NN  NN  NN      TT
MM      MM  MM      MM  GG          EEEEEEEE        XX      PPPPPPPP    CC          NN  NN  NN      TT
MM      MM  MM      MM  GG  GGGGGG  EE            XX  XX    PP          CC          NN    NNNN      TT
MM      MM  MM      MM  GG  GGGGGG  EE            XX  XX    PP          CC          NN    NNNN      TT
MM      MM  MM      MM  GG      GG  EE          XX      XX  PP          CC          NN      NN      TT          ....
MM      MM  MM      MM  GG      GG  EE          XX      XX  PP          CC          NN      NN      TT          ....
MM      MM  MM      MM    GGGGGG    EEEEEEEEEE  XX      XX  PP            CCCCCCCC  NN      NN      TT          ....
MM      MM  MM      MM    GGGGGG    EEEEEEEEEE  XX      XX  PP            CCCCCCCC  NN      NN      TT          ....

LL              IIIIII      SSSSSSSS
LL              IIIIII      SSSSSSSS
LL                II      SS
LL                II      SS
LL                II      SS
LL                II      SS
LL                II        SSSSSS
LL                II        SSSSSS
LL                II              SS
LL                II              SS
LL                II              SS
LL                II              SS
LLLLLLLLLL      IIIIII    SSSSSSSS
LLLLLLLLLL      IIIIII    SSSSSSSS
```

Table of contents

```
0000     1 ;                    MEMORY MANAGEMENT SERVICES TEST #5
0000     2 ;
0000     3 ;           .TITLE  MMGEXPCNT - TEST OF $EXPREG/$CNTREG SYSTEM SERVICES
0000     4 ;           .IDENT  'V04-000'
0000     5 ;
0000     6 ;*****************************************************************************
0000     7 ;*                                                                           *
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0000    25 ;*                                                                           *
0000    26 ;*                                                                           *
0000    27 ;*****************************************************************************
0000    28
0000    29 ;++
0000    30 ; FACILITY: USER MODE MEMORY MANAGEMENT SERVICES TEST
0000    31 ;
0000    32 ; ABSTRACT: THIS SET OF ROUTINES TESTS THE MEMORY MANAGEMENT SERVICES
0000    33 ;
0000    34 ; ENVIRONMENT: USER MODE DIAGNOSTIC
0000    35 ;
0000    36 ; AUTHOR: PETER H. LIPMAN       , CREATION DATE: 6-JAN-77
0000    37 ;
0000    38 ; MODIFIED BY:
0000    39 ;
0000    40 ;       V02-012 SHZ0004          Stephen Zalewski        20-Aug-1980
0000    41 ;               Incorporated this program into MMG test package.
0000    42 ;
0000    43 ;       V02-012 TSC0004          Thomas Clark            25-Jul-1980
0000    44 ;               Added further tests to system services tested in this
0000    45 ;               program.
0000    46 ;
```

```
0000     48          .SBTTL DECLARATIONS
0000     49 ;
0000     50 ; INCLUDE FILES:
0000     51 ;
0000     52          .SBTTL  MACROS
0000     53 ;
0000     54 ; MACROS:
0000     55 ;
0000     56          .MACRO  LIST
0000     57          .LIST   MEB
0000     58          .ENDM   LIST
0000     59
0000     60          .MACRO  NLIST
0000     61          .NLIST  MEB
0000     62          .ENDM   NLIST
0000     63
0000     64          .MACRO  DELTVA  STARTVA,ENDVA,STATUS=S^#SS$_NORMAL,-
0000     65                           INADR=W^INRANGE,RETADR=W^RETRANGE
0000     66          LIST
0000     67                  .IF     NB,STARTVA
0000     68                  MOVL    STARTVA,W^INRANGE
0000     69                  .ENDC
0000     70                  .IF     NB,ENDVA
0000     71                  MOVL    ENDVA,W^INRANGE+4
0000     72                  .ENDC
0000     73                  MOVZWL  STATUS,R3
0000     74                  MOVAL   INADR,R0
0000     75                  MOVAL   RETADR,R1
0000     76                  BSBW    DELTVASUBR
0000     77          NLIST
0000     78          .ENDM   DELTVA
0000     79
0000     80          .MACRO  CNTREG  PAGCNT,REGION=#0,STATUS=S^#SS$_NORMAL,-
0000     81                  RETADR=W^RETRANGE
0000     82          LIST
0000     83                  MOVZWL  STATUS,R3
0000     84                  MOVL    PAGCNT,R4
0000     85                  MOVAL   RETADR,R1
0000     86                  .IF     IDN,<REGION>,<#0>
0000     87                  CLRL    R5
0000     88                  .IFF
0000     89                  MOVL    REGION,R5
0000     90                  .ENDC
0000     91                  BSBW    CNTREGSUBR
0000     92          NLIST
0000     93          .ENDM   CNTREG
0000     94
0000     95          .MACRO  EXPREG  PAGCNT,REGION=#0,STATUS=S^#SS$_NORMAL,-
0000     96                  RETADR=W^RETRANGE
0000     97          LIST
0000     98                  MOVZWL  STATUS,R3
0000     99                  MOVL    PAGCNT,R4
0000    100                  MOVAL   RETADR,R1
0000    101                  .IF     IDN,<REGION>,<#0>
0000    102                  CLRL    R5
0000    103                  .IFF
0000    104                  MOVL    REGION,R5
```

```
                     0000   105                     .ENDC
                     0000   106                     BSBW    EXPREGSUBR
                     0000   107             NLIST
                     0000   108             .ENDM   EXPREG
                     0000   109
                     0000   110             .MACRO  RANGECHK ONOROFF
                     0000   111             LIST
                     0000   112             .IF     IDN <ONOROFF>,<OFF>
                     0000   113                     BICL    #CTL$M_RNGCHK,W^CTLFLG
                     0000   114             .IFF
                     0000   115                     BISL    #CTL$M_RNGCHK,W^CTLFLG
                     0000   116             .ENDC
                     0000   117             NLIST
                     0000   118             .ENDM   RANGECHK
                     0000   119
                     0000   120 ;
                     0000   121 ; EQUATED SYMBOLS:
                     0000   122 ;
                     0000   123             $SSDEF
                     0000   124             $SECDEF
                     0000   125             $PRTDEF
                     0000   126             $GBLINI
                     0000   127             $VIELD  CTL,0,<-                        ;DEFINE CONTROL BITS IN R3
                     0000   128                     <MEMLOOP,,MASK>,-               ;LOOP IN MEMORY WRITE LOOP
                     0000   129                     <TSTLOOP,,MASK>,-               ;REDO ENTIRE TEST FROM TOP
                     0000   130                     <PIDMSG,,MASK>,-                ;PUT PROCESS ID IN EACH TYPEOUT
                     0000   131                     <RNGCHK,,MASK>-                 ;ON IF CHECKING RETURN RANGE
                     0000   132                     >
           00000010  0000   133             PRT$C_NONE=1@4
                     0000   134 ;
                     0000   135 ; OWN STORAGE:
                     0000   136 ;
```

```
                        0000   138          .SBTTL  DATA STORAGE AND MESSAGE STRINGS
                    00000000   139          .PSECT  DATA0,PAGE,WRT,NOEXE
                        0000   140 INRANGE:
                    00000008   141          .BLKL   2
                        0008   142 RETRANGE:
                    00000010   143          .BLKL   2
                    00000006   144 CTLFLG: .LONG   CTL$M_TSTLOOP!CTL$M_PIDMSG
                    00000018   145 SAVEND: .BLKL   1
                        0018   146 HIGHPOADR:
                    0000001C   147          .BLKL   1                          ;LAST BYTE ADDRESS IN PO SPACE
                    00000020   148 PID:    .BLKL   1                          ;PROCESS ID
                        0020   149 MAXPASSCNT:
                    00000003   150          .LONG   3                          ;NUMBER OF PASSES TO RUN
                        0024   151 PASSCNT:
                    00000028   152          .BLKL   1                          ;PASS COUNTER
                        0028   153 WRKSETLIM:
                    0000002C   154          .BLKL   1                          ;RETURNED NEW WORKING SET LIMIT
                        002C   155 WRKSETDEF:
                    00000044   156          .BLKL   6                          ;DEFAULT, MAX, MIN WORKING SET LIMIT
                    00000034   157          WRKSETMAX=WRKSETDEF+8
                    0000003C   158          WRKSETMIN=WRKSETDEF+16
                        0044   159 WRKSETMAXADD:
                    00000048   160          .BLKL   1                          ;WRKSETMAX-WRKSETDEF
                        0048   161 PREVPROT:
                        0048   162 FAB:     $FAB    FAC=PUT, FNA=OUTNAMADR, FNS=OUTNAMSIZ ;FAB FOR OUTPUT
                        0098   163 RAB:     $RAB    FAB=FAB                    ;RECORD ACCESS BLOCK FOR OUTPUT
                    000000E0   164 MSGLEN: .BLKL   1                          ;RETURN LENGTH FROM FAO
000000FE'000000A0'      00E0   165 MSGBUFD:.LONG    MSGBUFSIZ,MSGBUF           ;MESSAGE BUFFER DESCRIPTOR
                        00E8   166 PIDMSGD:
000000FA'00000004'      00E8   167          .LONG   MSGBUF-PIDMSG,PIDMSG
                        00F0   168 ;
                        00F0   169 ; ***** DO NOT SEPARATE OR REORDER THE FOLLOWING LINES
                        00F0   170 ;
                        00F0   171 MSGBUFID:
                  0A 0D 00F0   172 CRLF:    .BYTE   ^O15,^O12
20 53 53 45 43 4F 52 50 00F2   173          .ASCII  $PROCESS $
                  20 20 20 20   00FA   174 PIDMSG: .ASCII  $    $
                    0000019E   00FE   175 MSGBUF: .BLKB   160                  ;MESSAGE BUFFER USED BY FAO
                    000000A0   019E   176          MSGBUFSIZ=.-MSGBUF
                               019E   177 ;
                               019E   178 ; ***** DO NOT SEPARATE OR REORDER THE PRECEEDING LINES
                               019E   179 ;
                               019E   180
                           00000000   181          .PSECT  DATA1,PAGE,WRT,NOEXE
                               0000   182 ;
                               0000   183 WRTPAGES:
                           00000800   184          .BLKL   128*4
                               0800   185
                           00000000   186          .PSECT  DATA2,PAGE,NOWRT,NOEXE
                               0000   187 RDPAGES:
                           00000800   188          .BLKL   128*4
                               0800   189
```

```
                                                H 6
                                00000000    191          .PSECT  CODE,PAGE,NOWRT,EXE
                                      0000  192
                                      0000  193 OUTNAMADR:
      54 55 50 54 55 4F 24 53 59 53   0000  194          .ASCII  /SYS$OUTPUT/
                                  0000000A  000A  195          OUTNAMSIZ=.-OUTNAMADR
                                      000A  196
                                      000A  197 DELTVAERRADR:
52 52 45 20 41 56 54 4C 45 44 2F 21   000A  198          .ASCII  $!/DELTVA ERROR - PC = !XL,STATUS WAS !XL, SHOULD BE !XL$
58 21 20 3D 20 43 50 20 2D 20 52 4F   0016
53 41 57 20 53 55 54 41 54 53 2C 4C   0022
44 4C 55 4F 48 53 20 2C 4C 58 21 20   002E
                  4C 58 21 20 45 42 20 003A
21 20 3D 20 52 44 41 4E 49 09 2F 21   0041  199          .ASCII  $!/     INADR = !XL - !XL, RETADR = !XL - !XL!/$
45 52 20 2C 4C 58 21 20 2D 20 4C 58   004D
2D 20 4C 58 21 20 3D 20 52 44 41 54   0059
                  2F 21 4C 58 21 20   0065
                                  00000061  006B  200          DELTVAERRSIZ=.-DELTVAERRADR
                                      006B  201
                                      006B  202 CNTREGERRADR:
52 52 45 20 47 45 52 54 4E 43 2F 21   006B  203          .ASCII  $!/CNTREG ERROR - PC = !XL, STATUS WAS !XL, SHOULD BE !XL$
58 21 20 3D 20 43 50 20 2D 20 52 4F   0077
41 57 20 53 55 54 41 54 53 20 2C 4C   0083
4C 55 4F 48 53 20 2C 4C 58 21 20 53   008F
                  4C 58 21 20 45 42 20 44 009B
20 3D 20 54 4E 43 47 41 50 09 2F 21   00A3  204          .ASCII  $!/     PAGCNT = !UL, REGION = P!UB SPACE, $
20 4E 4F 49 47 45 52 20 2C 4C 55 21   00AF
45 43 41 50 53 20 42 55 21 50 20 3D   00BB
                              20 2C   00C7
4C 58 21 20 3D 20 52 44 41 54 45 52   00C9  205          .ASCII  $RETADR = !XL - !XL!/$
                  2F 21 4C 58 21 20 2D 20 00D5
                                  00000072  00DD  206          CNTREGERRSIZ=.-CNTREGERRADR
                                      00DD  207
                                      00DD  208 EXPREGERRADR:
52 52 45 20 47 45 52 50 58 45 2F 21   00DD  209          .ASCII  $!/EXPREG ERROR - PC = !XL, STATUS WAS !XL, SHOULD BE !XL$
58 21 20 3D 20 43 50 20 2D 20 52 4F   00E9
41 57 20 53 55 54 41 54 53 20 2C 4C   00F5
4C 55 4F 48 53 20 2C 4C 58 21 20 53   0101
                  4C 58 21 20 45 42 20 44 010D
20 3D 20 54 4E 43 47 41 50 09 2F 21   0115  210          .ASCII  $!/     PAGCNT = !SL, REGION = P!UB SPACE, $
20 4E 4F 49 47 45 52 20 2C 4C 53 21   0121
45 43 41 50 53 20 42 55 21 50 20 3D   012D
                              20 2C   0139
4C 58 21 20 3D 20 52 44 41 54 45 52   013B  211          .ASCII  $RETADR = !XL - !XL!/$
                  2F 21 4C 58 21 20 2D 20 0147
                                  00000072  014F  212          EXPREGERRSIZ=.-EXPREGERRADR
                                      014F  213
                                      014F  214 RANGERRADR:
4E 41 52 20 4E 52 55 54 45 52 2F 21   014F  215          .ASCII  $!/RETURN RANGE ERROR - LOCATION = !XL$
4C 20 2D 20 52 4F 52 52 45 20 45 47   015B
58 21 20 3D 20 4E 4F 49 54 41 43 4F   0167
                              4C      0173
21 20 3D 20 52 44 41 4E 49 09 2F 21   0174  216          .ASCII  $!/     INADR = !XL - !XL, RETADR = !XL - !XL!/$
45 52 20 2C 4C 58 21 20 2D 20 4C 58   0180
2D 20 4C 58 21 20 3D 20 52 44 41 54   018C
                  2F 21 4C 58 21 20   0198
                                  0000004F  019E  217          RANGERRSIZ=.-RANGERRADR
                                      019E  218
```

```
                                                019E    219 DMDZERRADR:
43 20 54 4F 4E 20 45 47 41 50 2F 21             019E    220         .ASCII  $!/PAGE NOT CREATED DEMAND ZERO!/$
4E 41 4D 45 44 20 44 45 54 41 45 52             01AA
               2F 21 4F 52 45 5A 20 44          01B6
                                   00000020     01BE    221         DMDZERRSIZ=.-DMDZERRADR
                                                01BE    222
                                                01BE    223 IDMSGADR:
4E 41 4D 20 59 52 4F 4D 45 4D 2F 21             01BE    224         .ASCII  $!/MEMORY MANAGEMENT SERVICES TEST #5 (EXPCNT), PASS !UL!/$
56 52 45 53 20 54 4E 45 4D 45 47 41             01CA
35 23 20 54 53 45 54 20 53 45 43 49             01D6
50 20 2C 29 54 4E 43 50 58 45 28 20             01E2
            2F 21 4C 55 21 20 53 53 41          01EE
                                   00000039     01F7    225         IDMSGSIZ=.-IDMSGADR
                                                01F7    226
                                                01F7    227 RUN1_MSGADR:
20 20 2A 2A 2A 2A 2A 20 20 20 2F 21             01F7    228         .ASCII  $!/   *****   TEST WILL NOW BE RUN USING REGULAR VA SPACE   *****$
4E 20 4C 4C 49 57 20 54 53 45 54 20             0203
53 55 20 4E 55 52 20 45 42 20 57 4F             020F
20 52 41 4C 55 47 45 52 20 47 4E 49             021B
2A 20 20 20 45 43 41 50 53 20 41 56             0227
                        2A 2A 2A 2A             0233
                                   20 2F 21     0237    229         .ASCII  $!/ $
                                   00000043     023A    230         RUN1_MSGSIZ=.-RUN1_MSGADR
                                                023A    231
                                                023A    232 PIDCTLADR:
                                   4C 55 21     023A    233         .ASCII  $!UL$
                                   00000003     023D    234         PIDCTLSIZ=.-PIDCTLADR
```

```
                                                J 6
                     023D    236 ;
                     023D    237 ; STRING DESCRIPTORS
                     023D    238 ;
                     023D    239         .ALIGN  LONG
                     0240    240
                     0240    241 DELTVAERR:
0000000A'00000061    0240    242         .LONG   DELTVAERRSIZ,DELTVAERRADR
                     0248    243 CNTREGERR:
0000006B'00000072    0248    244         .LONG   CNTREGERRSIZ,CNTREGERRADR
                     0250    245 EXPREGERR:
000000DD'00000072    0250    246         .LONG   EXPREGERRSIZ,EXPREGERRADR
                     0258    247 RANGERR:
C000014F'0000004F    0258    248         .LONG   RANGERRSIZ,RANGERRADR
                     0260    249 DMDZERR:
0000019E'00000020    0260    250         .LONG   DMDZERRSIZ,DMDZERRADR
                     0268    251 IDMSG:
000001BE'00000039    0268    252         .LONG   IDMSGSIZ,IDMSGADR
                     0270    253 RUN1_MSG:
000001F7'00000043    0270    254         .LONG   RUN1_MSGSIZ,RUN1_MSGADR
                     0278    255 PIDCTL:
0000023A'00000003    0278    256         .LONG   PIDCTLSIZ,PIDCTLADR
                     0280    257
```

```
                                0280   259          .SBTTL  INITIALIZATION
                                0280   260 ;*******************************************************************************
                                0280   261 ;PROGRAM DESCRIPTION:
                                0280   262 ;
                                0280   263 ;          THIS PROGRAM TESTS THE FOLLOWING SYSTEM SERVICES:
                                0280   264 ;               $EXPREG, $CNTREG
                                0280   265 ;
                                0280   266 ;          THE PROGRAM DOES SOME SIMPLE EXPAND AND CONTRACT REGIONS TO CHECK
                                0280   267 ;        THAT THE SERVICES PERFORM CORRECTLY. FOLLOWING THIS THE PROGRAM FORCES
                                0280   268 ;        POSSIBLE ERROR PATHS FOR THE ABOVE MENTIONED SYSTEM SERVICES.  THREE
                                0280   269 ;        PASSES ARE MADE THROUGH THE TEST LOOP TO ENSURE PATH REPEATABILITY.
                                0280   270 ;        ONLY REGULAR VA SPACE IS USED IN THIS TEST PROGRAM.
                                0280   271 ;
                                0280   272 ;          REFER TO MASD$:[MMGTST.COM]MMGTST.RAP FOR FURTHER INFORMATION
                                0280   273 ;        REGARDING JUST HOW COMPLETELY THE ABOVE MENTIONED SYSTEM SERVICES
                                0280   274 ;        ARE TESTED BY THIS PROGRAM.
                                0280   275 ;
                                0280   276 ;       *PRIVILEGES:
                                0280   277 ;          THIS PROGRAM NEEDS NO SPECIAL PRIVILEGES TO EXECUTE.
                                0280   278 ;*******************************************************************************
                                0280   279 ;
                                0280   280 ; START HERE
                                0280   281 ;
                          0000  0280   282 START:   .WORD   0                                ;ENTRY MASK
                                0282   283          $OPEN   W^FAB                           ;OPEN THE FILE ''$OUTPUT''
                     0E 50 E9   028D   284          BLBC    R0,10$                          ;BRANCH IF ERROR
                                0290   285          $CONNECT W^RAB                          ;CONNECT THE RECORD ACCESS BLOCK
                     09 50 E8   029B   286          BLBS    R0,20$
                                029E   287 10$:      $EXIT_S R0                              ;EXIT WITH STATUS IN R0
 00000024'EF    01 D0   02A7   288 20$:      MOVL    #1,PASSCNT                              ;INITIALIZE THE PASS COUNT
                                02AE   289          $RESUME_S PID                           ;SET UP PROCESS ID
 50    0000001C'EF 3C   02BD   290          MOVZWL  PID,R0
                                02C4   291          $FAO_S  PIDCTL,MSGLEN,PIDMSGD,R0        ;INIT THE PROCESS ID STRING
                                02DC   292 ;
                                02DC   293 ;  INFORM OPERATOR THAT TESTS WILL BE RUN USING ONLY NORMAL VA SPACE
                                02DC   294 ;
                                02DC   295          $FAO_S  RUN1_MSG,MSGLEN,MSGBUFD         ;INFORM OPR NORMAL VA USED FOR TEST
                     02B5 30    02F2   296          BSBW    TYPEMSGBUF
     0010'CF    04 CA   02F5   297          BICL    #CTL$M_PIDMSG,W^CTLFLG          ;STOP PROCESS ID FROM PRINTING
                                02FA   298 RSTART:
                                02FA   299          RANGECHK ON
     0010'CF    08 CB   02FA                                BISL    #CTL$M_RNGCHK,W^CTLFLG
                                02FF   300          $FAO_S  IDMSG,MSGLEN,MSGBUFD,PASSCNT
                     028B 30    031C   301          BSBW    TYPEMSGBUF
                                031F   302          EXPREG  #1
          53    01 3C   031F                                MOVZWL  S^#SS$_NORMAL,R3
          54    01 D0   0322                                MOVL    #1,R4
     51   0008'CF DE   0325                                MOVAL   W^RETRANGE,R1
               55 D4   032A                                CLRL    R5
               0198 30 032C                                BSBW    EXPREGSUBR
     52   0008'CF 7D   032F   303          MOVQ    W^RETRANGE,R2
     0000'CF    52 7D   0334   304          MOVQ    R2,W^INRANGE
     0014'CF    52 D0   0339   305          MOVL    R2,W^SAVEND
```

```
                     033E   307          .SBTTL  EXPAND/CONTRACT REGION TEST
                     033E   308 ;
                     033E   309 ; TEST EXPAND/CONTRACT REGION
                     033E   310 ;
                     033E   311          EXPREG  #1,#0                           ;EXPAND BY 1 PAGE IN P0 SPACE
     53    01    3C  033E                MOVZWL  S^#SS$_NORMAL,R3
     54    01    D0  0341                MOVL    #1,R4
51   0008'CF    DE  0344                MOVAL   W^RETRANGE,R1
          55    D4  0349                CLRL    R5
        0179    30  034B                BSBW    EXPREGSUBR
        0293    30  034E          312   BSBW    DMDZERTST                       ;CHECK FOR DEMAND ZEROING
                     0351   313          CNTREG  #1,#0                           ;CONTRACT 1 PAGE P0 SPACE
     53    01    3C  0351                MOVZWL  S^#SS$_NORMAL,R3
     54    01    D0  0354                MOVL    #1,R4
51   0008'CF    DE  0357                MOVAL   W^RETRANGE,R1
          55    D4  035C                CLRL    R5
        0150    30  035E                BSBW    CNTREGSUBR
                     0361   314          EXPREG  #1,#1                           ;EXPAND 1 PAGE P1 SPACE
     53    01    3C  0361                MOVZWL  S^#SS$_NORMAL,R3
     54    01    D0  0364                MOVL    #1,R4
51   0008'CF    DE  0367                MOVAL   W^RETRANGE,R1
     55    01    D0  036C                MOVL    #1,R5
        0155    30  036F                BSBW    EXPREGSUBR
        026F    30  0372          315   BSBW    DMDZERTST                       ;CHECK FOR DEMAND ZEROING
                     0375   316          CNTREG  #1,#1                           ;CONTRACT 1 PAGE P1 SPACE
     53    01    3C  0375                MOVZWL  S^#SS$_NORMAL,R3
     54    01    D0  0378                MOVL    #1,R4
51   0008'CF    DE  037B                MOVAL   W^RETRANGE,R1
     55    01    D0  0380                MOVL    #1,R5
        012B    30  0383                BSBW    CNTREGSUBR
```

```
                                0386   318          .SBTTL  FORCE ERRORS FROM EXPREG/CNTREG
                                0386   319 ;
                                0386   320 ; FORCE ERRORS FROM EXPAND/CONTRACT REGION
                                0386   321 ;
                                0386   322          EXPREG  #1,#0,STATUS=#SS$_ACCVIO,RETADR=W^4 ;EXPAND W/INVALID RETADR
          53    0C   3C          0386                MOVZWL  #SS$_ACCVIO,R3
          54    01   D0          0389                MOVL    #1,R4
     51   0004'CF   DE          038C                MOVAL   W^4,R1
               55   D4          0391                CLRL    R5
             0131   30          0393                BSBW    EXPREGSUBR
                                0396   323          CNTREG  #1,#0,STATUS=#SS$_ACCVIO,RETADR=W^4 ;CONTRACT W/INVALID RETADR
          53    0C   3C          0396                MOVZWL  #SS$_ACCVIO,R3
          54    01   D0          0399                MOVL    #1,R4
     51   0004'CF   DE          039C                MOVAL   W^4,R1
               55   D4          03A1                CLRL    R5
             010B   30          03A3                BSBW    CNTREGSUBR
                                03A6   324          EXPREG  #-1,#0,STATUS=#SS$_ILLPAGCNT    ;EXPAND W/ILLEGAL PAGE COUNT
          53   00FC 8F   3C     03A6                MOVZWL  #SS$_ILLPAGCNT,R3
     54  FFFFFFFF 8F   D0     03AB                MOVL    #-1,R4
     51   0008'CF   DE          03B2                MOVAL   W^RETRANGE,R1
               55   D4          03B7                CLRL    R5
             010B   30          03B9                BSBW    EXPREGSUBR
                                03BC   325          CNTREG  #-1,#0,STATUS=#SS$_ILLPAGCNT    ;CONTRACT W/ILLEGAL PAGE COUNT
          53   00FC 8F   3C     03BC                MOVZWL  #SS$_ILLPAGCNT,R3
     54  FFFFFFFF 8F   D0     03C1                MOVL    #-1,R4
     51   0008'CF   DE          03C8                MOVAL   W^RETRANGE,R1
               55   D4          03CD                CLRL    R5
             00DF   30          03CF                BSBW    CNTREGSUBR
                                03D2   326          EXPREG  #1@21-1,#0,STATUS=#SS$_VASFULL  ;FILL THE PAGE TABLE, P0
          53   0244 8F   3C     03D2                MOVZWL  #SS$_VASFULL,R3
     54  001FFFFF 8F   D0     03D7                MOVL    #1@21-1,R4
     51   0008'CF   DE          03DE                MOVAL   W^RETRANGE,R1
               55   D4          03E3                CLRL    R5
             00DF   30          03E5                BSBW    EXPREGSUBR
                                03E8   327          RANGECHK OFF
     0010'CF   08   CA          03E8                BICL    #CTL$M_RNGCHK,W^CTLFLG
                                03ED   328          DELTVA  INADR=W^RETRANGE                ;DELETE WHAT WE CREATED
          53    01   3C          03ED                MOVZWL  S^#SS$_NORMAL,R3
     50   0008'CF   DE          03F0                MOVAL   W^RETRANGE,R0
     51   0008'CF   DE          03F5                MOVAL   W^RETRANGE,R1
             004D   30          03FA                BSBW    DELTVASUBR
                                03FD   329          RANGECHK ON
     0010'CF   08   C8          03FD                BISL    #CTL$M_RNGCHK,W^CTLFLG
                                0402   330          EXPREG  #1@21-1,#1,STATUS=#SS$_VASFULL  ;FILL THE PAGE TABLE, P1
          53   0244 8F   3C     0402                MOVZWL  #SS$_VASFULL,R3
     54  001FFFFF 8F   D0     0407                MOVL    #1@21-1,R4
     51   0008'CF   DE          040E                MOVAL   W^RETRANGE,R1
          55    01   D0          0413                MOVL    #1,R5
             00AE   30          0416                BSBW    EXPREGSUBR
                                0419   331          RANGECHK OFF
     0010'CF   08   CA          0419                BICL    #CTL$M_RNGCHK,W^CTLFLG
                                041E   332          DELTVA  INADR=W^RETRANGE                ;DELETE WHAT WE CREATED
          53    01   3C          041E                MOVZWL  S^#SS$_NORMAL,R3
     50   0008'CF   DE          0421                MOVAL   W^RETRANGE,R0
     51   0008'CF   DE          0426                MOVAL   W^RETRANGE,R1
             001C   30          042B                BSBW    DELTVASUBR
                                042E   333          RANGECHK ON
```

```
0010'CF   08   C8  042E                    BISL    #CTL$M_RNGCHK,W^CTLFLG
```

```
                        0433    335 ;
                        0433    336 ;END OF LOOP
                        0433    337 ;
OC 0024'CF    0020'CF   F3  0433    338          AOBLEQ  W^MAXPASSCNT,W^PASSCNT,160$
               50   01    D0  043B    339 150$:    MOVL    #1,R0
                        043E    340          $EXIT_S R0
                   FEB0   31  0447    341 160$:    BRW     RSTART
```

```
                     044A   343          .SBTTL  SUBROUTINES TO CALL THE SERVICES
                     044A   344 ;
                     044A   345 ; INPUT:
                     044A   346 ;
                     044A   347 ;       R0 = INADR
                     044A   348 ;       R1 = RETADR
                     044A   349 ;       R3 = DESIRED STATUS
                     044A   350 ;
                     044A   351 ; OUTPUT:
                     044A   352 ;
                     044A   353 ;       R2 PRESERVED
                     044A   354 ;
                     044A   355 DELTVASUBR:
                     044A   356          $DELTVA_S       (R0),(R1)
 51   FDE5 CF   DE   0457   357          MOVAL           W^DELTVAERR,R1          ;ERROR CONTROL STRING
           00   11   045C   358          BRB             CHECK1
                     045E   359
                     045E   360 CHECK1:
      53   50   D1   045E   361          CMPL    R0,R3                   ;STATUS AS DESIRED
           4B   13   0461   362          BEQL    10$                     ;BRANCH IF YES
 53   0244 8F   B1   0463   363          CMPW    #SS$_VASFULL,R3         ;IF EXPECTING VIRTUAL ADDRESS SPACE FULL
           05   12   0468   364          BNEQ    5$
      50   1C   B1   046A   365          CMPW    #SS$_EXQUOTA,R0         ;THEN EXCEEDS QUOTA MAY ALSO BE RETURNED
           3F   13   046D   366          BEQL    10$
           54   DD   046F   367 5$:       PUSHL   R4
   54   04 AE   D0   0471   368          MOVL    4(SP),R4                ;ADDRESS OF ERROR
                     0475   369          $FAO_S  (R1),MSGLEN,MSGBUFD,R4,R0,R3,-
                     0475   370                  INRANGE,INRANGE+4,RETRANGE,RETRANGE+4
           10   BA   04A8   371          POPR    #^M<R4>
         00FD   30   04AA   372          BSBW    TYPEMSGBUF
                05   04AD   373          RSB
                     04AE   374 10$:
         007F   31   04AE   375          BRW     RANGECHK                ;GO CHECK THE RETURN RANGE
                     04B1   376
```

```
                     04B1    378 ;
                     04B1    379 ; INPUT:
                     04B1    380 ;
                     04B1    381 ;       R1 = RETADR
                     04B1    382 ;       R3 = DESIRED STATUS
                     04B1    383 ;       R4 = PAGCNT
                     04B1    384 ;       R5 = REGION
                     04B1    385 ;
                     04B1    386 ; OUTPUT:
                     04B1    387 ;
                     04B1    388 ;       R2 PRESERVED
                     04B1    389 ;
                     04B1    390 CNTREGSUBR:
                     04B1    391         $CNTREG_S R4,(R1),,R5
 51   FD84 CF    DE  04C0    392         MOVAL   W^CNTREGERR,R1                  ;ERROR CONTROL STRING
            14  11   04C5    393         BRB     CHECK2
                     04C7    394 ;
                     04C7    395 ; INPUT:
                     04C7    396 ;
                     04C7    397 ;       R1 = RETADR
                     04C7    398 ;       R3 = DESIRED STATUS
                     04C7    399 ;       R4 = PAGCNT
                     04C7    400 ;       R5 = REGION
                     04C7    401 ;
                     04C7    402 ; OUTPUT:
                     04C7    403 ;
                     04C7    404 ;       R2 PRESERVED
                     04C7    405 ;
                     04C7    406 EXPREGSUBR:
                     04C7    407         $EXPREG_S R4,(R1),,R5
 51   FD76 CF    DE  04D6    408         MOVAL   W^EXPREGERR,R1                  ;ERROR CONTROL STRING
```

```
                                                E 7
                     04DB   410 CHECK2:
                 53  50 D1  04DB   411         CMPL    R0,R3                   ;STATUS AS DESIRED?
                     39 13  04DE   412         BEQL    10$                     ;BRANCH IF YES
                     56 DD  04E0   413         PUSHL   R6
                56   04 AE  D0    04E2   414         MOVL    4(SP),R6                ;ADDRESS OF ERROR
                            04E6   415         $FAO_S  (R1),MSGLEN,MSGBUFD,R6,R0,R3,R4,R5,-
                            04E6   416                 RETRANGE,RETRANGE+4
                0040 8F     BA     0511   417         POPR    #^M<R6>
                   0092     30     0515   418         BSBW    TYPEMSGBUF
                            05     0518   419         RSB
          0000'CF   0008'CF D0     0519   420 10$:    MOVL    W^RETRANGE,W^INRANGE    ;MAKE INPUT RANGE LOOK LIKE CRETVA/D
                            54     D7     0520   421         DECL    R4
                54  54      09     78     0522   422         ASHL    #9,R4,R4
       0004'CF    0000'CF  54     C1     0526   423         ADDL3   R4,W^INRANGE,W^INRANGE+4
                            00     11     052E   424         BRB     RANGECHK                ;AND CHECK THE RETURN RANGE
                                   0530   425
                                   0530   426 RANGECHK:
             73 0010'CF     03     E1     0530   427         BBC     #CTL$V_RNGCHK,W^CTLFLG,40$      ;BRANCH IF RANGE CHECK IS DISABLED
                   70       50     E9     0536   428         BLBC    R0,40$                  ;IF ERROR IN SERVICE, SKIP THE RANGE
                50  0000'CF  7D     0539   429         MOVQ    W^INRANGE,R0            ;R0 = STARVA, R1 = ENDVA
                    51       50     D1     053E   430         CMPL    R0,R1                   ;WHICH DIRECTION?
                             12     1A     0541   431         BGTRU   10$                     ;BRANCH IF BACKWARDS
                             04     1F     0543   432         BLSSU   5$                      ;BRANCH IF FORWARDS
                  0C 50      1E     E0     0545   433         BBS     #30,R0,10$              ;FOR EQUAL, P0 SPACE FORWARDS, P1 BA
                                   0549   434 ;
                                   0549   435 ; REQUESTED RANGE IS FORWARDS
                                   0549   436 ;
                50  01FF 8F     AA     0549   437 5$:     BICW    #^X1FF,R0               ;FROM BYTE 0 OF STARTVA
                51  01FF 8F     AB     054E   438         BISW    #^X1FF,R1               ;THROUGH LAST BYTE OF ENDVA
                             0A     11     0553   439         BRB     20$                     ;
                                   0555   440 ;
                                   0555   441 ; GOING BACKWARDS IN VIRTUAL ADDRESS SPACE
                                   0555   442 ;
          50    01FF 8F     A8     0555   443 10$:    BISW    #^X1FF,R0               ;LAST BYTE OF STARTVA
          51    01FF 8F     AA     055A   444         BICW    #^X1FF,R1               ;THROUGH FIRST BYTE OF ENDVA
     0008'CF       50     D1     055F   445 20$:    CMPL    R0,W^RETRANGE           ;IS THIS WHAT WAS RETURNED?
                   07     12     0564   446         BNEQ    30$                     ;BRANCH IF NOT, ERROR
     000C'CF       51     D1     0566   447         CMPL    R1,W^RETRANGE+4         ;THIS ONE OK TOO?
                   3C     13     056B   448         BEQL    40$                     ;BRANCH IF YES, RANGE OK
                   53     DD     056D   449 30$:    PUSHL   R3                      ;SAVE REGISTER
            53   04 AE     D0     056F   450         MOVL    4(SP),R3                ;TO USE FOR ERROR PC
                            0573   451         $FAO_S  <W^RANGERR>,MSGLEN,MSGBUFD,R3,- ;FORMAT THE ERROR MESSAGE
                            0573   452                 INRANGE,INRANGE+4,RETRANGE,RETRANGE+4
                      08    BA     05A4   453         POPR    #^M<R3>                 ;RESTORE SAVE REGISTER
                    0001    30     05A6   454         BSBW    TYPEMSGBUF              ;OUTPUT THE ERROR MESSAGE
                            05     05A9   455 40$:    RSB                             ;AND RETURN
```

```
                                05AA   457          .SBTTL  MISCELLANEOUS SUBROUTINES
                                05AA   458 ;
                                05AA   459 ; TYPE A MESSAGE
                                05AA   460 ;       MSGBUF IS THE ADDRESS OF THE BEGINNING OF THE STRING
                                05AA   461 ;       MSGLEN CONTAINS THE SIZE (IN BYTES) OF THE STRING
                                05AA   462 ;
                                05AA   463 TYPEMSGBUF:
      50    00DC'CF    D0      05AA   464          MOVL    W^MSGLEN,R0                     ;SIZE TO R0
      51    00FE'CF    DE      05AF   465          MOVAL   W^MSGBUF,R1                     ;ADDRESS TO R1
   08 0010'CF    02    E1      05B4   466          BBC     #CTL$V_PIDMSG,W^CTLFLG,5$       ;BRANCH IF NO PROCESS ID REQUIRED
      51    00F0'CF    DE      05BA   467          MOVAL   W^MSGBUFID,R1                   ;ADDRESS INCLUDING PID MSG
            50    0E'  C0      05BF   468          ADDL    S^#<MSGBUF-MSGBUFID>,R0         ;INCLUDE EXTRA BYTES IN COUNT
                                05C2   469 5$:
   00C0'CF    51    D0      05C2   470          MOVL    R1,W^RAB+RAB$L_RBF              ;SET BUFFER ADDRESS
   00BA'CF    50    B0      05C7   471          MOVW    R0,W^RAB+RAB$W_RSZ              ;AND SIZE
                                05CC   472          $PUT    W^RAB                           ;OUTPUT THE MESSAGE
            01 50    E9      05D7   473          BLBC    R0,20$
                     05      05DA   474          RSB
                                05DB   475 20$:    $EXIT_S R0                              ;EXIT WITH ERROR STATUS
                                05E4   476 ;
                                05E4   477 ; TEST FOR DEMAND ZEROING
                                05E4   478 ;       RETRANGE CONTAINS RANGE TO BE TESTED
                                05E4   479 ;
                                05E4   480 DMDZERTST:
      50    00000003'EF    D0      05E4   481          MOVL    RETRANGE,R0                     ;GET ADDR TO START ON
                     60    D5      05EB   482 5$:      TSTL    (R0)                            ;CHECK A LONGWORD
                     0B    12      05ED   483          BNEQU   10$
FFF2 50    04    0000000C'EF    F1      05EF   484          ACBL    RETRANGE+4,#4,R0,5$             ;AND LOOP
                     05      05F9   485          RSB
                                05FA   486 10$:    $FAO_S  <W^DMDZERR>,MSGLEN,MSGBUFD      ;FORMAT THE ERROR MESSAGE
                  FF96    30      0611   487          BSBW    TYPEMSGBUF                      ;OUTPUT IT
                     05      0614   488          RSB                                     ;AND RETURN
                                0615   489
                                0615   490          .END    START
```

```
$$.TAB                  = 00000098 R      02
$$.TABEND               = 000000DC R      02
$$.TMP                  = 00000000
$$.TMP1                 = 00000001
$$.TMP2                 = 000000CF
$$T1                    = 00000000
$$T2                    = 00000003
BIT...                  = 00000004
CHECK1                    0000045E R      05
CHECK2                    000004DB R      05
CNTREGERR                 00000248 R      05
CNTREGERRADR              00000068 R      05
CNTREGERRSIZ            = 00000072
CNTREGSUBR                000004B1 R      05
CRLF                      000000F0 R      02
CTL$M_MEMLOOP           = 00000001
CTL$M_PIDMSG            = 00000004
CTL$M_RNGCHK            = 00000008
CTL$M_TSTLOOP           = 00000002
CTL$V_MEMLOOP           = 00000000
CTL$V_PIDMSG            = 00000002
CTL$V_RNGCHK            = 00000003
CTL$V_TSTLOOP           = 00000001
CTLFLG                    00000010 R      02
DELTVAERR                 00000240 R      05
DELTVAERRADR              0000000A R      05
DELTVAERRSIZ            = 00000061
DELTVASUBR                0000044A R      05
DMDZERR                   00000260 R      05
DMDZERRADR                0000019E R      05
DMDZERRSIZ              = 00000020
DMDZERTST                 000005E4 R      05
EXPREGERR                 00000250 R      05
EXPREGERRADR              000000DD R      05
EXPREGERRSIZ            = 00000072
EXPREGSUBR                000004C7 R      05
FAB                       00000048 R      02
FAB$C_BID               = 00000003
FAB$C_BLN               = 00000050
FAB$C_SEQ               = 00000000
FAB$C_VAR               = 00000002
FAB$L_ALQ               = 00000010
FAB$L_FOP               = 00000004
FAB$V_CHAN_MODE         = 00000002
FAB$V_FILE_MODE         = 00000004
FAB$V_LNM_MODE          = 00000000
FAB$V_PUT               = 00000000
FAB$W_GBC               = 00000048
HIGHPOADR                 00000018 R      02
IDMSG                     00000268 R      05
IDMSGADR                  000001BE R      05
IDMSGSIZ                = 00000039
INRANGE                   00000000 R      02
MAXPASSCNT                00000020 R      02
MSGBUF                    000000FE R      02
MSGBUFD                   000000E0 R      02
MSGBUFID                  000000F0 R      02
MSGBUFSIZ               = 000000A0
MSGLEN                    000000DC R      02
OUTNAMADR                 00000000 R      05
OUTNAMSIZ               = 0000000A
PASSCNT                   00000024 R      02
PID                       0000001C R      02
PIDCTL                    00000278 R      05
PIDCTLADR                 0000023A R      05
PIDCTLSIZ               = 00000003
PIDMSG                    000000FA R      02
PIDMSGD                   000000E8 R      02
PREVPROT                  00000048 R      02
PRT$C_NONE              = 00000010
RAB                       00000098 R      02
RAB$B_RAC               = 0000001E
RAB$C_BID               = 00000001
RAB$C_BLN               = 00000044
RAB$C_SEQ               = 00000000
RAB$L_CTX               = 00000018
RAB$L_RBF               = 00000028
RAB$L_ROP               = 00000004
RAB$W_RSZ               = 00000022
RANGECHK                  00000530 R      05
RANGERR                   00000258 R      05
RANGERRADR                0000014F R      05
RANGERRSIZ              = 0000004F
RDPAGES                   00000000 R      04
RETRANGE                  00000008 R      02
RSTART                    000002FA R      05
RUN1_MSG                  00000270 R      05
RUN1_MSGADR               000001F7 R      05
RUN1_MSGSIZ             = 00000043
SAVEND                    00000014 R      02
SIZ...                  = 00000001
SS$_ACCVIO              = 0000000C
SS$_EXQUOTA             = 0000001C
SS$_ILLPAGCNT           = 000000FC
SS$_NORMAL              = 00000001
SS$_VASFULL             = 00000244
START                     00000280 R      05
SYS$CNTREG                ******** GX     05
SYS$CONNECT               ******** GX     05
SYS$DELTVA                ******** GX     05
SYS$EXIT                  ******** GX     05
SYS$EXPREG                ******** GX     05
SYS$FAO                   ********  X     05
SYS$OPEN                  ******** GX     05
SYS$PUT                   ******** GX     05
SYS$RESUME                ******** GX     05
TYPEMSGBUF                000005AA R      05
WRKSETDEF                 0000002C R      02
WRKSETLIM                 00000028 R      02
WRKSETMAX               = 00000034 R      02
WRKSETMAXADD              00000044 R      02
WRKSETMIN               = 0000003C R      02
WRTPAGES                  00000000 R      03
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
DATA0	0000019E (414.)	02 (2.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC PAGE
DATA1	00000800 (2048.)	03 (3.)	NOPIC USR CON REL LCL NOSHR NOEXE RD WRT NOVEC PAGE
DATA2	00000800 (2048.)	04 (4.)	NOPIC USR CON REL LCL NOSHR NOEXE RD NOWRT NOVEC PAGE
CODE	00000615 (1557.)	05 (5.)	NOPIC USR CON REL LCL NOSHR EXE RD NOWRT NOVEC PAGE

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	17	00:00:00.07	00:00:01.69
Command processing	87	00:00:00.80	00:00:04.16
Pass 1	305	00:00:10.78	00:00:39.16
Symbol table sort	0	00:00:01.21	00:00:03.71
Pass 2	109	00:00:02.42	00:00:06.24
Symbol table output	13	00:00:00.10	00:00:00.10
Psect synopsis output	3	00:00:00.03	00:00:00.05
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	536	00:00:15.41	00:00:55.11

The working set limit was 1200 pages.
61911 bytes (121 pages) of virtual memory were used to buffer the intermediate code.
There were 50 pages of symbol table space allocated to hold 866 non-local and 16 local symbols.
490 source lines were read in Pass 1, producing 23 object records in Pass 2.
41 pages of virtual memory were used to define 34 macros.

Macro library statistics

Macro library name	Macros defined
_255DUA28:[SYS.OBJ]LIB.MLB;1	0
_255DUA28:[SYSLIB]STARLET.MLB;2	25
TOTALS (all libraries)	25

1120 GETS were required to define 25 macros.

There were no errors, warnings or information messages.

```
MACRO/LIS=LIS$:MMGEXPCNT/OBJ=OBJ$:MMGEXPCNT MSRC$:MMGEXPCNT/UPDATE=(ENH$:MMGEXPCNT)+EXECML$/LIB
```

MMGEXPCNT
LIS

MMGSNSFWSL
LIS

MOM
MAP

MMGCRTDEL
LIS

MMGCRDLSP
LIS

MMGCRTFIL
LIS

MMGLKWULW
LIS

MMGXQUOTA
LIS

MMGSETPRT
LIS

MOM